

Results of TDM/ Transit Light Scenario (Alternatives 3 & 4)

April 24, 2017



Overview

- Overview of Alternatives and Scenarios
- Comparison of Sullivan Sq./Rutherford Surface & Underpass Options
- Results of Policies Tested
- Conclusions
- Next Steps

Alt.3: TDM / Transit Light

- Bus Improvements
 - Bike and Pedestrian Improvements
 - Constrained Residential Parking / Auto Availability
 - Reduce Commercial Parking Use / Parking Cost
 - Work at Home Policies
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- Sullivan Square /Rutherford Improvements
Surface Option (Alt. 3S)
 - Sullivan Square /Rutherford Improvements
Underpass Option (Alt. 3U)

Overview of Alternatives

| | NB | Alt. 1 | Alt. 2 | Alt. 3S | Alt. 3U | Alt. 4.1S | Alt. 4.1U | Alt. 4.2S | Alt. 4.2U | Alt. 5 | Alt. 5.1 | Alt. 6 | Alt. 6.1 | Alt. 7 | Alt. 8 |
|---|----|--------|--------|---------|---------|-----------|-----------|-----------|-----------|--------|----------|--------|----------|--------|--------|
| MAPC LRTP Land Use | X | | | | | | | | | | | | | | |
| MAPC Planned Growth Scenario | | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| LRTP Transportation Projects (a) | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Sullivan Sq & Rutherford Ave Redesign (Surface) | X | X | | X | | X | | X | | ? | ? | ? | ? | ? | ? |
| Sullivan Sq & Rutherford Ave Redesign (Underpass) | | | X | | X | | X | | X | ? | ? | ? | ? | ? | ? |
| Parking - Residential | | | | X | X | - | - | X | X | | | | X | | |
| Employee | | | | X | X | X | X | - | - | | | | X | | |
| Bus Improvements | | | | X | X | X | X | X | X | | | | | | |
| TMA Shuttle | | | | X | X | X | X | X | X | | | | | | |
| Bike/Pedestrian | | | | X | X | X | X | X | X | | | X | X | X | |
| TDM - Work at Home | | | | X | X | X | X | X | X | | | | | | |
| I-93 Improvements (Convert HOV to GP) | | | | | | | | | | X | X | | | | |
| I-93 Improvements (City Square NB On-Ramp) | | | | | | | | | | X | X | | | | |
| I-93 Improvements (Sullivan Square NB Off-Ramp) | | | | | | | | | | X | | | | | |
| Silver Line Extension (Chelsea to Kendall Sq) | | | | | | | | | | | | X | X | | |
| GLX2 | | | | | | | | | | | | X | X | | |
| New Sullivan Sq Station on the Rock/Newb. CR | | | | | | | | | | | | X | X | | |
| Major Bike/Ped. (Ped Bridge Assembly To Everett) | | | | | | | | | | | | | | X | |
| New Orange Line Station at Rivers Edge (b) | | | | | | | | | | | | | | X | |
| Orange Line Spur to Everett | | | | | | | | | | | | | | | X |

(a) Includes 4.5 minute headways on Orange Line.

(b) Includes 3.0 minute headways on Orange Line.

Alt. 3: Comparison of Sullivan Sq. / Rutherford Options

Underpass performs better than the Surface Option in the focus area, benefits decrease further away from Rutherford similar to the benefits identified in the analysis of Alt. 1 and Alt. 2.

- The underpass improves vehicle throughput of impact area by 1.4% in AM and 2.1% in PM.
- 19 intersections experienced a reduction in delay in the AM and 15 intersections in the PM.
- No significant difference in transit use between Underpass and Surface option.
- Will use underpass results going forward for simplicity.

Alt. 3: Comparison of Sullivan Sq. / Rutherford Options

The traffic differences between Alt.3S and Alt.3U after testing both with the TDM and Transit improvements were similar to Alt. 1 and Alt .2.

- Focus area experiences significant decreases in SOV use.
- Significant backfilling of freed up capacity occurs due to regional trips.
- Roadways on the periphery of study area experience benefits in the 3S and 3U options - such as Rte. 28, Rte. 38, and Rte. 1 due to mode shift in the impact area.

Alt. 3U: Proposed Bus Improvements

Existing MBTA bus improvements

Route 85, CT2 Route 87, Route 88, Route 90, Route 99, Route 104, Route 105, Route 106, Route 109, Route 110, & Route 112

New Bus Routes

- Everett-downtown limited stop route
- New Lechmere to Kendall Square, Route 92A
- CT4 - Sullivan and Kenmore
- Charlestown Circulator
- TMA bus improvements

Busways/Bus lanes

Everett

- Broadway between Route 16 and Ferry St
- Broadway between Route 16 and Alford St. Bridge

Cambridge

- First Street
- Binney Street
- Third Street

Alt. 3U: Bus Improvements

Operations in the AM & PM Peaks

- 4,100 Revenue Miles Added in
- 560 Revenue Hours Added
- Tripling of bus revenue miles in the corridor

Results - Buses

- 150% increases in bus ridership on targeted routes
- Top Routes
 1. Everett-to-Boston Route
 2. CT4
 3. Route 110

Alt. 3U: Bus Improvements

Orange Line

- Line experiences a 10% increase in boardings
- Sullivan Square has a 50% increase in boardings

Linked Transit Trips

- 30,000 new transit trips in the AM
- 150,000 new transit trips daily

Capacity

- Orange Line has potential capacity issues south of Sullivan
- Sullivan Square activity increases significantly
- Several new bus routes have demand that exceed the capacity

Alt. 3U: Bicycle & Pedestrian Improvements

- 1) Complete Streets approach resulting in an increase in walking and biking amenities for trips focused on only those modes in the study area in order to improve non-motorized mode shares.
- 2) Improved walking and biking amenities to and from transit stations resulting in shorter access times which make transit a better option.
- 3) Speed reductions on local streets as a traffic calming option in order to promote walkers and bikers.

Alt. 3U: Pedestrian and Bicycling

- Non-motorized mode shares improve slightly in the peaks (under 1%), off-peaks would experience the largest increases (1-2%).
- Walk trips to transit increase significantly.
- Residential parking restrictions force more

Alt. 3:

Commercial Parking Pricing

Policy: market-rate employer parking as a TDM strategy

Range of daily market-rate garages in Kendall Square is \$22-\$43

- ▶ Average (unweighted): \$30
- ▶ Median: \$27.5

Locations: Used a \$22 daily parking rate to TAZs in:

- ▶ Union Square
- ▶ Brick Bottom/Inner Belt
- ▶ Assembly Row
- ▶ Sullivan Square
- ▶ Everett Commercial Triangle

Alt. 3U:

Commercial Parking Pricing

(2040 Parking Price (18 TAZs) / Prudential TAZ)

- Population = 37,800 / 1,455
- Households = 18,700 / 955
- Service Employment = 21,400 / 8,615
- Retail Employment = 17,200 / 2,723
- Basic Employment = 12,900 / 209

(2040 Area Trip Characteristics (18 TAZs) / Prudential #)

- Total HB Work trip attractions = 242,200 / 14,080
- Total HB Personal Business attractions = 169,950 / 3,299
- Total HB Social Recreation attractions = 110,800 / 1,160
- Total Non-Home Based Trips = 101,150 / 1,827

Alt. 3U: Commercial Parking Pricing

Alt 3U Mode Shares / Prudential(2016) Mode Shares

| Mode | AM | MD | PM | NT |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|
| Auto Mode Shares | 42.2% / 46.2% | 34.3% / 36.4% | 42.4% / 44.4% | 38.8% / 40.1% |
| Transit Mode Shares | 48.7% / 44.6% | 47.8% / 46.6% | 37.9% / 37.1% | 37.4% / 38% |
| Non-motorized mode shares | 9.2% / 9.2% | 17.9% / 17% | 19.7% / 18.5% | 23.9% / 21.9% |

Alt. 3U & 4.1U: Commercial Parking Pricing

Alt. 3U Mode Share Change

| Mode | AM | PM |
|---------------------|-------|-------|
| Auto Mode Shares | -4.5% | -3.2% |
| Transit Mode Shares | 5.4% | 3.8% |

Alt. 4.1U Mode Share Change

| Mode | AM | PM |
|---------------------|-------|-------|
| Auto Mode Shares | -3.7% | -1.8% |
| Transit Mode Shares | 3.2% | 1.1% |

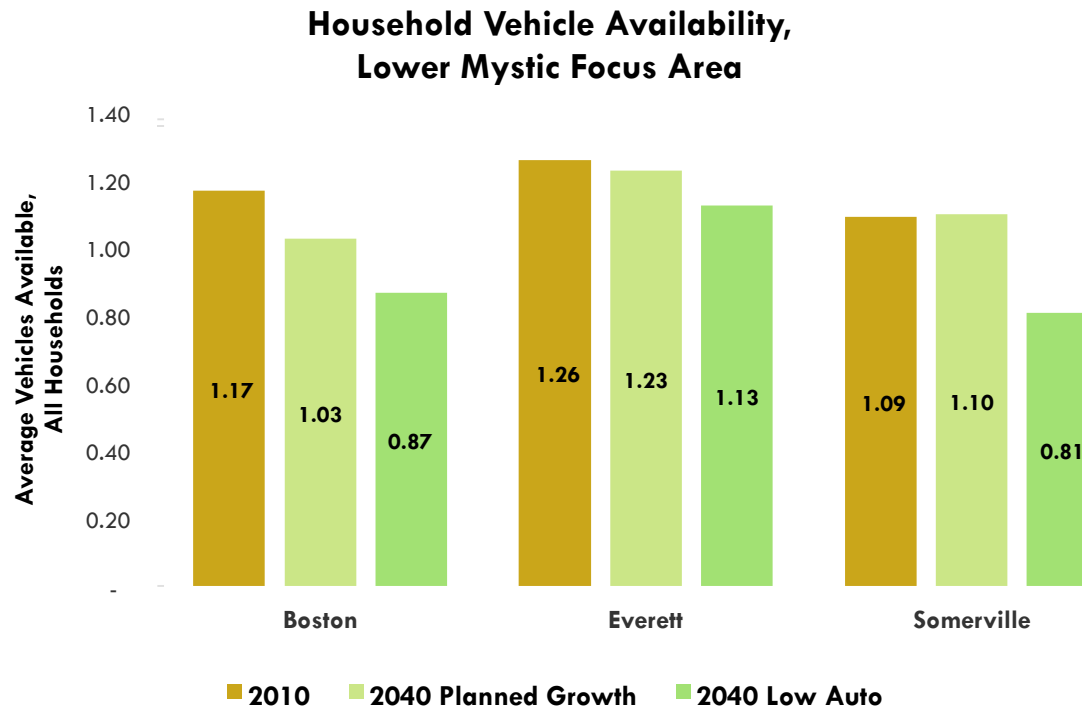
- Alt. 3U represents the mode share improvements due to all transportation and TDM polices examined with the Rutherford Underpass Option.
- Alt. 4.1U identifies the mode share improvements due to all transportation and TDM polices, except the commercial parking pricing policy, and using the Rutherford Underpass Option.

Alt. 3U: Commercial Parking

Conclusions

- Mode shares similar to activity at Prudential Center
- Reduction in SOV trips
- Increase in HOV trips
- Increase in rapid transit trips and local bus
- Affected a smaller area which already had high transit mode shares, but it still led to a measurable improvement

Alt. 3U: Residential Parking Restrictions



Note: Parking restrictions represented as an increase in households with 0-vehicles

Alt. 3U: Residential Parking Restrictions

2040 Focus Area (49 TAZs)

- Population = 118,270
- Households = 54,140
- Service Employment = 45,316
- Retail Employment = 26,714
- Basic Employment = 23,361

2040 Additional Trips Created due to 0 Vehicle Households

- 23,000 in the AM peak period
- 36,000 in the PM peak period

Alt. 3U & 4.2U: Residential Parking Restrictions

Alt. 3U Mode Share Change

| Mode | AM | PM |
|---------------------|-------|-------|
| Auto Mode Shares | -4.5% | -3.2% |
| Transit Mode Shares | 5.4% | 3.8% |

Alt. 4.2U Mode Share Change

| Mode | AM | PM |
|---------------------|-------|-------|
| Auto Mode Shares | -3.7% | -2.2% |
| Transit Mode Shares | 4.9% | 3.3% |

- Alt. 3U represents the mode share improvements due to all transportation and TDM polices examined with the Rutherford Underpass Option.
- Alt. 4.2U identifies the mode share improvements due to all transportation and TDM polices, except the residential parking restriction policy, and using the Rutherford Underpass Option.

Alt. 3U: Residential Parking Restrictions

Conclusions

- Policy leads to major shift in trip making behavior
- Increase in non-auto home based trips
- Shift in daily travel patterns from peak to off peak
- Reduction in SOV trips
- Increases HOV trips
- Increases transit trips
- Off-peak need more transit to accommodate demand, some trips couldn't be made.

Alt. 3: Telecommuting / Flexible Work Schedule

Telecommuting (working remotely) & flexible work schedules are Transportation Demand Management (TDM) strategies

- Focused on job sectors that don't require workers to be physically present
- Of those sectors, apply adjustment to commuters traveling to the study area
- Assume 25% of these commuters work remotely or off peak once per week

Alt. 3U: Work-at-home

TDM benefit = 1,200 daily work trips eliminated from the study area.

- 600 in each peak period
- 60% of these were SOV previously
- 35% of these were transit previously
- Very minor benefit to traffic flow in impact area

Summary of Results

- Sullivan Sq. / Rutherford Ave Underpass Option is better than the Surface Option in key locations.
- Transit & TDM Policies have desired benefit in the Impact Area and reduce SOV use.
- Regional trips have limited options and want to utilize any freed up capacity generated by local improvements, so regional transit options are needed as well.
- Residential parking and commercial parking pricing strategies work equally well, but people need transit or TNC options to satisfy the non-SOV trips, especially in the off-peaks.

Next Steps

- Update on Project Costs
- Update on Alternative 5 & 6
- Discussion of Sullivan Square / Rutherford Options

Thank you

Questions and Comments

| Route | Communities Served | Peak Frequencies | Alignment Changes |
|---------------------------|--|-----------------------------|---|
| 85 | Cambridge, Somerville | Improved to 10 minutes | |
| 87 | Arlington, Cambridge, Somerville | Improved from 22 to 20 min. | |
| CT2 | Boston, Cambridge, Somerville | Improved to 10 minutes | |
| 90 | Boston, Cambridge, Somerville | Improved to 15 minutes | Section between McGrath Hwy and Sullivan Station rerouted to use Washington St. instead of Cross St. |
| 92A | Boston, Cambridge, Somerville | 15-18 minutes | Street in Charlestown, new portion between Main/West Street and Kendall via Gilmore Bridge, New Lechmere and Cambridge Busways. |
| 99 | Malden, Medford, Stoneham | 26 minutes | Truncated to only be portion of current route 99 north of Malden Station |
| 104 | Boston, Everett, Somerville, Cambridge | 16-18 minutes | Extended to Harvard Station via Union Square and current Route 86 alignment |
| 105 | Malden | 36 minutes | Truncated to only be portion of current route 105 north of Bowdoin St./Newland St. |
| 106 | Boston, Everett, Somerville, Cambridge | 15 minutes | Wellington, service continues along Lower Broadway until Sullivan station, route then extended to Central Square via Union Square |
| 106 Lebanon | Malden, Melrose | 22 minutes | Truncated to only be portion of Lebanon Loop variation of route 106 north of Malden Station |
| 106 Franklin | Malden, Melrose | 22 minutes | Truncated to only be portion of Franklin Square variation of route 106 north of Malden Station |
| 109 | Boston, Everett, Malden | 16 minutes | Rerouting of Linden Square-Broadway segment from Eastern Ave to Beach St., Salem St., Hunting St., and Broadway |
| 110 | Boston, Everett, Revere | 14 minutes | No longer serves Wellington, service shifts to along Lower Broadway Sullivan Station |
| 112 | Boston, Chelsea, Everett, Medford | 30 minutes | Wood Island end of service shifted to Airport Station |
| EZ Ride | Cambridge | Improved to 4 minutes | Uses Cambridge busways between Lechmere and Kendall |
| CT4 | Boston, Cambridge, Somerville | 10 minutes | Lechmere to Kendall alignment same as Lechmere-Kendall shuttle, Kendall to Kenmore via Main St., Vassar St., Mass Ave., Comm Ave (NB), Marlborough St. (SB) |
| Lechmere-Kendall Shuttle | Cambridge | 15 minutes | Uses Cambridge busways |
| Boston Limited Stop Route | Boston, Everett | 20 minutes | Runs between Woodlawn and Post Office Square via Elm St, Ferry St, Broadway, and Rutherford Ave. |
| TMA Shuttle | Boston, Cambridge, Somerville | 15 minutes | Runs between Porter and North Station via Union Square and Sullivan Square |

Alt. 3: Bus Improvements

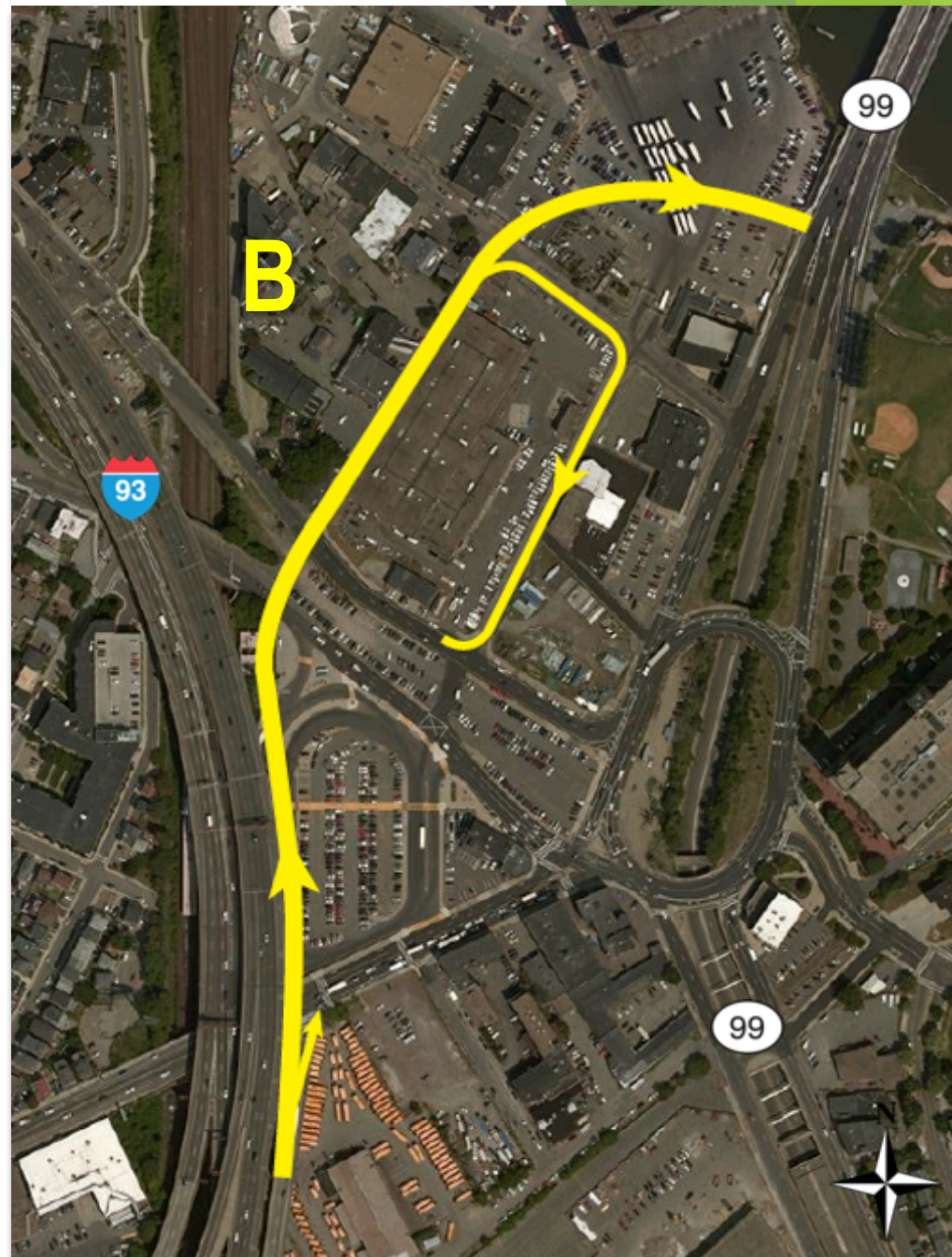
Alt. 5: City Square On-Ramp to I-93 Northbound

- Pros
- Cons



Alt. 5: I-93 Northbound Off-Ramp to Route 99/ Alford Street Bridge

- Pros
- Cons



Alt. 5: I-93 Southbound HOV Lane Conversion

- Pros
- Cons

